Wastewater Treatment Plant, Stage 1, Chugg Street, Walpole, Shire of Manjimup

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Water Corporation

Report and recommendations of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
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Summary and recommendations

This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the environmental factors, conditions and procedures relevant to the Water Corporation's proposal for a wastewater treatment plant in Walpole. The Water Corporation proposes to construct, commission, operate and maintain the plant at a site located on Chugg Street, Walpole, on a predominantly cleared portion of "C" Class Crown Reserve No. 29778 (Forestry Purposes) currently used as a depot by the Department of Conservation and Land Management. Effluent will initially be disposed of to a sub-surface infiltration trench located on a 6 metre wide firebreak/access track abutting, and partly within, the Walpole-Nornalup National Park. It is proposed within a few years, that the effluent be diverted to an irrigated tree lot located outside the Walpole-Nornalup National Park. The wastewater treatment plant will be performance based, so that outputs of treated effluent from the tertiary treatment phase will meet minimum specified requirements.

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

Relevant environmental factors

Although a number of environmental factors were considered by the EPA in the assessment, it is the EPA's opinion that the following are the environmental factors relevant to the proposal, which require detailed evaluation in the report:

(a) Vegetation Communities;

(b) Wetlands;

(c) Odour;

(d) Surface water quality - water courses and the Walpole and Nornalup Inlets; and

(e) Groundwater quality.

Conclusion

The EPA has concluded that the modified wastewater treatment plant proposal is capable of meeting the EPA's objectives subject to the Water Corporation's commitments and recommended EPA conditions.

Modifications to the original proposal include:

- almost total reduction in the areal extent of vegetation to be cleared, through relocation of the treatment plant to predominantly cleared land and withdrawal of the reed bed treatment system; and

- incorporation of alternative construction design and stormwater management structures, which minimises changes to surface and groundwater hydrology.

In arriving at its conclusion, the EPA also notes that a significant portion of the sedgeland vegetation and the supporting 'upland' wetland, including the wetland's topographic crest, is secured within the Walpole-Nornalup National Park and there will be no impact upon any Declared Rare Flora or Priority Species.

The EPA strongly supports the Water Corporation's intention to divert, as soon as possible, disposal of treated effluent from the temporary sub-surface infiltration trench to irrigate a treelot, located outside Walpole-Nornalup National Park. Nevertheless, the proposal for the treelot, including the alignment of the pressure main, will need to be referred to the EPA separately.

The EPA also advises, under the Other Advice section, that in order to ensure maintenance or enhancement of the conservation value of the Walpole and Nornalup Inlets, residents should be encouraged to connect to the sewerage system within as short a time as possible.

Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister considers the report on the relevant environmental factors of vegetation communities, wetlands, odour, surface water quality and groundwater quality as set out in Section 3.
2. The Minister notes that the EPA has concluded that the proposal can be managed in an environmentally acceptable manner, provided there is satisfactory implementation by the proponent of the recommended conditions summarised in Section 4 and set out in detail in Appendix 3.
3. The Minister imposes the conditions and procedures recommended in Appendix 3 of this report.

Conditions

Having considered the proponent's commitments and information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by the Water Corporation to construct, commission, operate and maintain a wastewater treatment plant on portion of Reserve 29778, Chugg Street, Walpole is approved for implementation. These conditions are presented in Appendix 3. Matters addressed in the conditions include the following:

(a) the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3; and

(b) in order to manage the environmental impacts of the project, and to fulfil the requirements of the conditions and procedures in this statement, prior to construction, the proponent shall demonstrate that there is in place an environmental management system which includes the following elements:

- environmental policy and commitment;
- planning of environmental requirements;
- implementation and operation of environmental requirements;
- measurement and evaluation of environmental performance; and
- review and improvement of environmental outcomes.

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1. Introduction and background

The Water Corporation, the proponent, proposes to construct, commission, operate and maintain a new Wastewater Treatment Plant (WWTP) on portion of "C" Class Crown Reserve No 29778 (Forestry Purposes) on Chugg Street to the northeast of the Walpole townsite (Figure 1). That portion of the Reserve is predominantly cleared and currently used as a depot by the Department of Conservation and Land Management.

The WWTP will treat and dispose of wastewater derived from the existing Walpole townsite and its environs. An overriding concern is the significance of the Walpole and Nornalup Inlets, and in this respect it is considered that the proposed WWTP is preferable to the current method of disposal, by septic tank/leach drain systems (Water and Rivers Commission, June 1998).

The proposal, the subject of this assessment, is for Stage 1, comprising 1,000 Equivalent Persons (EP) of wastewater treatment and disposal capacity.

The Minister for the Environment upheld appeals against the initial recommended level of assessment (Works Approval), and set a new assessment level of Consultative Environmental Review on the grounds that the site originally proposed could have special conservation values which derive from vegetation, flora and wetland characteristics. In order to minimise environmental impacts, a number of modifications to the original plan have been proposed.

Further details of the proposal are presented in Section 2 of this Report. Section 3 discusses environmental factors relevant to the proposal. Conditions and procedures to which the proposal should be subject if the Minister determines that it may be implemented are set out in Section 4. Section 5 sets out other advice arising from the proposal. Section 6 presents the EPA's conclusion and Section 7 the EPA's recommendations.

A list of people and organisations that made submissions is included in Appendix 1. References are listed in Appendix 2, and recommended conditions and procedures and proponent's commitments are provided in Appendix 3.

The DEP's summary of submissions and the proponent's response to those submissions has been published separately and is available in conjunction with this report.

2. The proposal

The Water Corporation, the proponent, proposes to construct, commission, operate and maintain a new WWTP on portion of the "C" Class Crown Reserve No. 29778 (Forestry Purposes) on Chugg Street, northeast of the Walpole townsite (Figure 1). That portion of the Reserve is predominantly cleared and currently used as a depot for the Department of Conservation and Land Management.

The WWTP will treat and dispose of wastewater derived from:

- staged infill of the existing Walpole townsite which currently uses septic tank/leach drain systems, and
- connection of the recently constructed Boronia Ridge residential development, where reticulated sewerage is installed, but collected wastewater is currently tankered to Albany for disposal.

The proposal, the subject of this assessment, is for Stage 1, comprising 1,000 Equivalent Persons (EP) of wastewater treatment and disposal capacity (see Figure 2). This capacity will easily cater for the current population (339 persons as at the 1996 Census) and also be sufficient for a considerable period of population growth. At full capacity, namely 1000 EP, the output of treated effluent will be 200 cubic metres per day.

Raw sewage from Walpole and Boronia Ridge will be subjected to an advanced tertiary treatment process, which will reduce the nutrient loads from domestic effluent disposal in Walpole to the Walpole and Nornalup Inlets by 95% for phosphorus and 75% for nitrogen. Faecal microorganisms will also be substantially reduced.

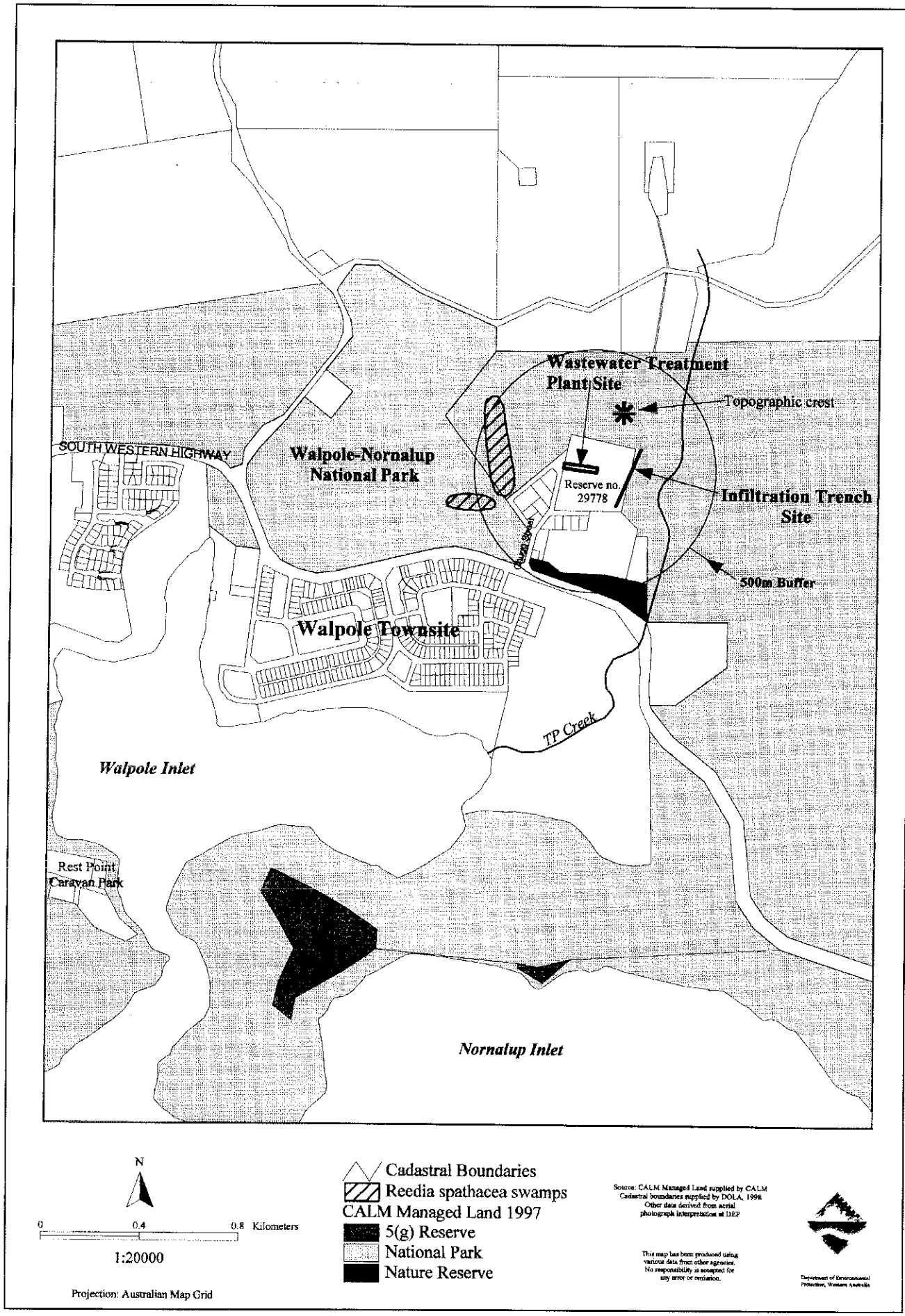

Figure 1. Location

The tertiary treated effluent is to be discharged to a sub-surface infiltration trench which is 208 metres long and 3 metres deep. The proposed sub-surface infiltration trench is located on a previously cleared, six metre wide access track/fire break, and will be located partly within the Walpole-Nornalup National Park. The treated effluent will seep downslope through the subsoil towards TP Creek and Walpole Inlet. Groundwater monitoring bores and surface water monitoring locations have been established to obtain baseline data, and vegetation monitoring transects are similarly being established. The proponent will divert the treated effluent for treelot disposal, to be located outside the Walpole-Nornalup National Park, before the WWTP reaches one-third of the design capacity, and possibly earlier. (The treelot does not form part of this assessment (1154) and will require separate referral to the Environmental Protection Authority.)

The Minister for the Environment upheld appeals against the initial recommended level of assessment for Stage 1 (Works Approval), and set a new assessment level of Consultative Environmental Review on the grounds that the site originally proposed could have special conservation values which derive from vegetation, flora and wetland characteristics. In order to minimise environmental impacts, a number of modifications to the original plan have been proposed.

The main characteristics of the modified proposal are summarised in Table 1 below.

Table 1: Summary of key proposal characteristics

Proposal Characteristic	Description
Life of project	Longterm - until service requirements exceed 1,000 equivalent persons (EP) - not known.
Output (treated effluent)	200 cubic metres per day at full capacity. First year output is estimated to be less than 20 cubic metres per day.
Estimated quality of output	Less than: 1 milligram per litre total phosphorus; 10 milligrams per litre total nitrogen; 10 milligrams per litre BOD5 (5 day biological oxygen demand); 20 milligrams per litre suspended solids; and 150 thermotolerant coliforms per 100 millilitres.
Area of disturbance: • treatment plant (including access); and • infiltration trench (beneath existing cleared access track).	 • less than 1 hectare; and • 208 metres long and 3 metres deep.
List of major components - • plant; • power supply; • chemical storage; • infiltration trench; and • car parking area.	See plans and specifications for details.

Since release of the Consultative Environmental Review (CER), a number of modifications to the proposal have been made by the proponent. These include:

- relocation of Stage 1 of the WWTP (the subject of this assessment) to a predominantly cleared portion of "C" Class Crown Reserve No. 29778, currently used as a depot by the Department of Conservation and Land Management;
- withdrawal of the Reed Bed Treatment System (RBTS) which, it is anticipated, will be permanently superseded by the early commissioning of a treelot facility. This modification reduces the areal extent of land to be used for the plant and access to less than 1 hectare;
- replacement of the proposed subsoil drainage system by on-site infiltration of stormwater into the soil profile, via soak wells and linear swale drains, to minimise changes to site hydrology and groundwater recharge within the site; and
- replacement of the need to excavate and fill the vegetated land with simple site levelling of the previously cleared land.

The potential impacts of the proposal initially predicted by the proponent and their proposed management are summarised in Section 5 of the CER document (Bowman Bishaw Gorham, 1998a).

3. Environmental factors

3.1 Relevant environmental factors

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

It is the EPA's opinion that the following are the environmental factors relevant to the proposal, which require detailed evaluation in this report:

(a) Vegetation communities;

(b) Wetlands;

(c) Odour;

(d) Surface water quality - water courses and the Walpole and Nornalup Inlets; and

(e) Groundwater quality.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors (preliminary factors) generated from the CER document and the submissions received, in conjunction with the proposal characteristics (including significance of the potential impacts), and the adequacy of the proponent's response and commitments. On this basis, the EPA considers that other issues raised in the submissions do not require further evaluation by the EPA. The identification process is summarised in Table 2.

The relevant environmental factors are discussed in Sections 3.2 to 3.6 of this report, and a summary of the assessment is provided in Table 3.

3.2 Vegetation Communities

Description

The proponent's original proposal for the construction of the WWTP, including its associated infrastructure and a Reed Bed Treatment System (RBTS) would have required the clearing of

Table 2: Identification of Relevant Environmental Factors

PRELIMINARY ENVIRONMENTAL FACTOR	PROPOSAL CHARACTERISTIC	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT FACTORS
BIOPHYSICAL			
Vegetation communities	Construction of wastewater treatment plant and associated infrastructure will require clearing of remnant vegetation which may be regionally significant. Proposal is adjacent to, and could impact upon, vegetation in Walpole-Nornalup National Park and other CALM estates.	1. V & C Semeniuk Research Group, on behalf of the Shire of Manjimup, contends that the CER vegetation survey and analysis was not sufficiently rigorous to establish the regional significance or otherwise of the site's vegetation. Their research results indicate that, contrary to the conclusions in the CER (and the implications in its Figure 14), the vegetation is a palusmont vegetation system which is unique and regionally significant (the Chugg Street Palusmont). 2. The secondary impacts of the proposal (weed invasion, alteration to both water and nutrient balances etc) may cause degradation of phreatophytic vegetation (adjacent to creekline), remnant vegetation, and vegetation in "C" Class Crown Reserve for Forestry Purposes (29778) and the Walpole National Park. CALM seeks compensation for these impacts, preferably in the form of a land swap. 3. The subsurface infiltration gallery, for discharge of final effluent, is located on the firebreak/access track, whose northern end is approximately 40m within the National Park area. 4. Works should be restricted to the west side of the existing track (Reserve 29778) so that part of the reserve on the eastern side of the track can be incorporated into the National Park. 5. Dieback occurrence should be delineated and control measures proposed. 6. The flora and vegetation survey for the CER was undertaken at the wrong time of the year to easily detect DRF and Priority Flora.	*Considered to be a Relevant Factor.*
Wetlands	The site contains a wetland which may be regionally significant, and there are wetlands in the Walpole-Nornalup National Park directly adjacent. Potential impacts on wetlands during treatment plant construction and	1. Rigorous and systematic hydrology studies are required (monthly hydrographs, rainfall graphs, and hydrochemical signatures linking rainfall to groundwater chemistry) to substantiate that the groundwater system is maintained entirely by rainfall rather than by a combination of rainfall and a distal source such as subartesian upwelling.	*Considered to be a Relevant Factor.*

PRELIMINARY ENVIRONMENTAL FACTOR	PROPOSAL CHARACTERISTIC	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT FACTORS
	subsequent land use.	2. If the area is maintained by subartesian/artesian upwelling, there will not be a zone of infiltration as proposed. The proposed trench will cut right through an area where the groundwater table forms permanent ponds in winter (30m west of piezometer location P5, which is 150m from TP Creek). 3. The hill-based nature of the wetland leads to an unusual situation in WA, in that there is a wide variation in winter and summer water levels which in turn supports an unusual wetland/dryland vegetation association. 4. *Reedia spathacea*, which is a primitive form of the Cyperaceae family is only a Priority 4 species (CALM), but Walpole should be considered the core location of the species and the *Reedia* swamps occurring in a variety of edaphic situations and sites (paluslope, palusplain and river environs) may be of national and international importance. The *Reedia* occurrence at the base of Site C's palusmont represents an important variation from other Walpole sites and is consequently of even greater significance. Alteration of the hydrology at Site C would risk disturbing the downslope population of *Reedia*. 5. The review of wetland classification is confused and hence misleading. It gives the impression that diverse classification systems have been applied in Western Australia, when actually there has been only one site-specific classification (that of C A Semeniuk 1987 for the Swan Coastal Plain, and that of Semeniuk & Semeniuk 1997 for global wetlands). The confusion diminishes the importance of wetland terminology which differentiates the Chugg Street Palusmont from other wetlands in the region. 6. Contrary to the statement in the CER, the term "palusmont" has appeared in peer-reviewed journals. Palusmonts are hill-capping wetlands that only form in wet climates. The Walpole region is the only location in the State where the climate is wet enough to develop and sustain palusmonts. To date, only two have been found - the subject site (Chugg Street Palusmont) and at "Boronia Ridge". Therefore, the wetlands are of State-wide significance as a wetland type.	

PRELIMINARY ENVIRONMENTAL FACTOR	PROPOSAL CHARACTERISTIC	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT FACTORS
Estuaries	The proposal may adversely impact upon the Walpole/Nornalup Inlets	1. The Water and Rivers Commission's overriding concern is the significance of the Walpole Nornalup Inlet. Although the estimates of nutrient loading rates (Sections 4.3, 4.5 and 4.6) are approximate, the proposed treatment plant should reduce the nutrient load, and when operating it is expected to achieve effluent quality commitments made by the proponent, which would be preferable to the use of septic tanks/leach drains. 2. If nutrients were to move quickly down TP Creek from disposal at Site C, there would be the possibility that for a time Walpole Inlet would be receiving nutrients from this source and still receiving nutrients from the leachate from under the Walpole townsite.	*Considered to be a Relevant Factor, but discussed under the factor of Surface water quality.*
POLLUTION			
Odour	Odours emanating from the proposed development may adversely affect the welfare and amenity of the Walpole township and surrounding community.	1. Data on wind directions and speeds is not provided to support the conclusion that a 500m buffer around the treatment plant would be adequate. Bureau of Meteorology regional information indicates that wind speeds and directions could deliver odours to the Walpole townsite during peak tourist seasons (eg January - speeds of 11-30 and >30km/hr from the NE quadrant; April - speeds of 11-30km/hr from the E quadrant). The northern fringe of the townsite is the commercial and tourist portion, so consequences will be greater than simply offending local residents. The proponent could access local weather data from CALM. 2. The tree buffer between the proposed treatment plan and Walpole townsite is not substantial, so odours will be readily noticeable.	*Considered to be a Relevant Factor.*
Groundwater quality	Groundwater under the site is likely to flow into the Walpole/Nornalup Inlets and may increase their nutrient loading.	1. Contrary to the statements that the final treated effluent is to be discharged into a dry sandy soil profile (Sections 4.3.3.2 & 3.1.6), the proposed infiltration trench intersects a dynamic aquifer (near piezometer P5) where the groundwater is very high during the wet season. If artesian upwelling is confirmed, the situation would be even more critical. The trench will fundamentally change the natural hydrological regime of the receiving area west of TP Creek. 2. Baseline monitoring of groundwater quality in the receiving environment should be conducted.	*Considered to be a Relevant Factor.*

PRELIMINARY ENVIRONMENTAL FACTOR	PROPOSAL CHARACTERISTIC	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT FACTORS
Surface water quality	Walpole Inlet and the watercourse (known as TP Creek) downslope from the infiltration trench may be adversely impacted (nutrients).	1. Given that clearing at Site C would result in a water table rise, where will excess water from the proposed subsoil drainage system be disposed of? If it is to end up in the groundwater and waterways of the National Park, the impacts have not been addressed. 2. No management strategies are planned, nor a monitoring program presented, to detect any effects of the treatment plant on the surrounding environment. The National Park will be affected hydrologically through discharge of subsoil drainage and excess water into the natural system (Walpole uses 55 megalitres of water per annum); and hydrochemically because the water will potentially be nutrient enriched. Failure of the system has not been addressed. 3. Nutrient absorption of soils between Site C and the natural drainage lines has not been documented. It is likely that the nutrients will not be retained in the soil and that the enriched water would be rapidly discharged to hydraulically lower sites (drainage lines). 4. A decrease of phosphorus loadings by 8-92% implies discharge of treated effluent retaining between 92-8% of phosphorus. This range is an unacceptably high possibility of success or failure in nutrient removal. 5. There is no description of the chemical (eg alum) dosing system for the effluent, nor where and how the materials and the bonded nutrients will be stored and disposed of. 6. Proposed final effluent quality from the RBTS (Section 4.5.3 - 0.6mg/L phosphorus and 0.5mg/L nitrogen) contains more phosphorus and similar or less nitrogen than groundwater. However, this quantification is not reliable, and the nutrient levels from the first phase (1mg/L phosphorus and 10mg/L nitrogen) are considerably higher than groundwater levels. 7. The Water and Rivers Commission (WRC) considers that insufficient detail has been provided in the following areas to demonstrate the ability of the facility to meet the expected effluent water quality: • pretreatment systems;	*Considered to be a Relevant Factor.*

PRELIMINARY ENVIRONMENTAL FACTOR	PROPOSAL CHARACTERISTIC	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT FACTORS
		• discussion of, or commitment to, chemical dosing; • details of how the final nitrogen concentration of 10 mg/L will be achieved (an anaerobic process is required to remove considerable quantities, but only an aerobic process is outlined); • detention times for effluent; • schematic drawings indicate system bypasses with the potential to redirect untreated effluent into the Reed Bed Treatment System (RBTS), which would be severely damaged and lose its ability to treat waste water; • international performance of RBTS should be validated in the local context (effectiveness is highly dependent upon influent quality); • RBTSs require significant active management to prevent decline in polishing performance and viability, leading to odour and nutrient problems. • design of impermeable membranes/barriers (as a minimum standard, WRCs draft *Water Quality Protection Guideline No. 3: The use of liners for chemicals, waste residue and wastewater containment* should be referenced); • phosphorus concentrations may be slightly above background level and could result in increased biological productivity in the phreatophytic vegetation adjacent to the creekline. 8. A program must be developed to monitor the WWTP every fortnight during commissioning to ensure that 85-90% of the samples comply with WRCs minimum performance criteria. 9. The operating licence should be based on the output from the second treatment phase (RBTS) rather than prior to RBTS as proposed. 10. The siliceous sands of the infiltration trench have poor nutrient removal capability, the slope below the trench is steep (12m fall over 150m to TP Creek), and TP Creek itself flows very fast (13m fall over 1300m to Walpole Inlet) so treated effluent (600kL/day at full capacity) could be discharged almost unaltered into Walpole Inlet.	

PRELIMINARY ENVIRONMENTAL FACTOR	PROPOSAL CHARACTERISTIC	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT FACTORS
		11. The infiltration trench has a fall of 4.5m over its 280m length, which will tend to duct most effluent towards the lowest southerly end rather than utilising the full length for the crossflow infiltration. The precautionary approach must be applied in this instance because, even though it is stated effluent will be close to background quality (Sections 4.3.3.2 and 4.5.3) contradictory statements indicate that final nutrient discharges cannot be reliably predicted (p.36 #6 and 7; p.49 #5; and Section 4.6.3 p.51).	

Table 3: Summary of Assessment of Relevant Environmental Factors

RELEVANT FACTOR	RELEVANT AREA	EPA OBJECTIVE	EPA ASSESSMENT	EPA ADVICE
BIOPHYSICAL				
Vegetation Communities - impact on remnant vegetation	Warren Biogeographical Region	Maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities.	There have been a number of modifications to the proposal subsequent to its public advertisement: • CALM has agreed in principle to the relocation of Stage 1 of the WWTP (the subject of this assessment) to a predominantly cleared portion of its "C" Class Crown Reserve No. 29778 (Forestry Purposes) currently in use as the CALM Depot; • the Reed Bed Treatment System (RBTS) has been withdrawn from the current Stage 1 proposal and may be permanently superseded by the early commissioning of a treelot facility. These modifications will result in little vegetation clearing. The sub-surface infiltration trench, for the discharge of final effluent is also located on a cleared area (a firebreak/access track) albeit partly within the Walpole-Nornalup National Park. The WC is seeking the NPNCA's approval for this aspect. Although the modifications have eliminated or minimised direct impacts, the indirect impacts from the WWTP and its infiltration trench could cause degradation of the phreatophytic vegetation and other vegetation in both the Crown Reserve and the adjacent Walpole-Nornalup National Park (part of which is the receiving area for the effluent discharged into the infiltration trench). It is noted, however, that the phreatophytic vegetation is in good biological condition despite having received decades of increased runoff, additional sediment load and increased nutrient loading from cleared, grazed land in the upper parts of TP Creek's catchment. The WC has undertaken to cease disposal to the infiltration trench when volumes exceed 60m3/day, which represents less than one-third of the operating capacity of Stage 1 of the WWTP, or within 5 years, whichever is sooner. Nutrient and hydrological impacts from short-term disposal of the relatively low loadings of treated effluent to the infiltration trench (until the treelot is commissioned) are not expected to be so significant as to affect the vegetation. Groundwater and nutrient levels will be monitored; monitoring bores have already been installed under agreement with	Having regard to: a) modifications to the WWTP proposal including: • relocation of Stage 1 of the WWTP to predominantly cleared land; and • withdrawal of the RBTS from the proposal; and b) the Water Corporation's commitments to: • monitor chemistry (including nutrient loadings) and water levels in the receiving environment; • undertake additional vegetation survey work to establish baseline data and a monitoring program; • monitor vegetation in the receiving environment; • cease disposal of treated effluent to the infiltration trench when volumes exceed 60m3/day, or within 5 years, or sooner if degradation of the receiving environment occurs; • minimise the risk of weed invasion through a land use management program, in consultation with CALM; • implement dieback hygiene protocols during the construction program, in accordance with CALM procedures; • compensate NPNCA (preferably in the form of a land swap) in the unlikely event of vegetation degradation or other

RELEVANT FACTOR	RELEVANT AREA	EPA OBJECTIVE	EPA ASSESSMENT	EPA ADVICE
			CALM. It is considered that the flora and vegetation survey for the CER was inadequate in terms of scope, timing and establishment of a monitoring program. The inappropriateness of the timing is illustrated by the fact that the timing of the survey in February would make it extremely difficult to identify several of the DRF or Priority species. It would, for example, involve digging out orchid bulbs and identifying them by their DNA. Consequently the WC has agreed to undertake the additional survey work required and to establish a vegetation monitoring program. In the unlikely event that the disposal of the treated effluent does cause degradation of vegetation in the Walpole-Nornalup National Park, the WC has stated that it will compensate the NPNCA. To minimise the risk of weed invasion to the Walpole-Nornalup National Park, the WC will consult with CALM in regard to species selection for screen plantings and will implement weed control consistent with land use management practices. With respect to dieback, the WC will require the construction contractor to implement dieback hygiene protocols in accordance with CALM procedures, and in consultation with DEP.	degradation occurring on their land as a result of operations of the WWTP and its associated infrastructure; it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for Vegetation Communities, contingent upon • approval from the NPNCA for the infiltration trench to enter upon National Park land.
Wetlands	Wetlands surrounding Walpole, including Walpole Inlet	Maintain the integrity, functions and environmental values of wetlands.	Site C contains an upland wetland, which may be of regional significance. It has not been clearly substantiated whether the wetland's seasonal variation between winter and summer water levels derives from an excess of rainfall over evaporation and the area's geomorphology, or, alternatively, is maintained by a combination of rainfall and water from a distal source such as subartesian upwelling. As a result, the full extent of the wetland cannot be clearly delineated, but one estimate is that the sedgelands cover approximately 8-10ha. Approximately 70-80% of that sedgeland area, including the wetland's topographic crest (north of Site C), is secured within the Walpole-Nornalup National Park. In response to public submissions and subsequent negotiations, the WWTP proposal has been modified so that: • development and its consequent site impact has been reduced in size (to less than 1ha in extent), due to the withdrawal of the RBTS; • the WWTP will now be located on predominantly cleared land on that part of the CALM Depot which is currently being used for the	Having regard to : a) modifications to the WWTP proposal, including: • reduction in the areal extent of land to be used; • location of infrastructure on predominantly cleared land; and • minimisation of changes to hydrology through use of alternative construction design; and b) the fact that a large portion of the sedgelands, including the topographic crest of the wetland, is secured within the Walpole-Nornalup National Park; c) the WC's commitments to:

RELEVANT FACTOR	RELEVANT AREA	EPA OBJECTIVE	EPA ASSESSMENT	EPA ADVICE
			purpose of explosives storage; • alternative construction design minimises changes to site hydrology by using direct recharge to the ground of stormwater collected on impervious surfaces (as close as possible to the area where the rainwater is collected). These techniques replace the earlier proposal to construct subsoil drainage (outlined in the CER, Appendix B). In addition, groundwater monitoring bores have been installed and surface water sampling points located to facilitate gathering of baseline data and the ongoing monitoring of water levels and chemistry, including nutrient loadings. Recent data (June 1998) confirms that the site proposed for the infiltration trench does not display a perched or seasonally high water table and that the valley slope terrain located east of the trench consists of deep sands with a water table at 4.05-5.65m below surface. As a result, the infiltration process is expected to operate efficiently. The hydraulic efficiency of the sloping infiltration trench will be maximised by the use of impervious barriers (every 20m) which will increase the flooded cross section area. The nearest swamplands with *Reedia spathacea* populations are to the west of Site C in a broad drainage line located within the National Park. The modified proposal should not detrimentally affect the catchment's hydrology or the *Reedia* population, particularly given that the drainage line's catchment is approximately 200ha and includes cleared farmland (approx. 90ha), cleared residential land, the Walpole townsite and the CALM depot (approx. 30ha).	• minimise changes to existing shallow groundwater flow and groundwater recharge by incorporation of stormwater management structures; • monitor and report on ground and surface water quality (chemistry, including nutrient loadings, and water levels); it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for Wetlands.
POLLUTION				
Odour	Walpole township and surrounding community	Odours emanating from the proposed development should not adversely affect the welfare and amenity of other land users.	The Walpole wind data held by CALM does not meet the requirements of dispersion modelling (using AUSPLUME). However, dissipation of odour emissions increases in magnitude and effectiveness as the velocity of prevailing wind increases, so that when winds are strong there will be very low odour nuisance risk in surrounding downwind areas. The modern advanced treatment system planned at Walpole utilises a biological process operating in an oxygen rich environment. The risk of release of hydrogen sulphide at the plant inlet is low because the	Having regard to: a) the WC's commitment, in the event of odour nuisance being observed outside the buffer area, to implement odour control measures in consultation with DEP; and b) the fact that the WWTP will be subject to DEP's license conditions;

RELEVANT FACTOR	RELEVANT AREA	EPA OBJECTIVE	EPA ASSESSMENT	EPA ADVICE
			wastewater will be relatively fresh. The process and plant proposed at Walpole seldom produces the earthy type odour which can sometimes result from the biological process. Should odour nuisance be observed outside the buffer area, the WC can implement odour control measures so that operation is in compliance with DEP's license conditions.	it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for Odour.
Groundwater quality	Groundwater below the Walpole townsite and its environs, including the Walpole-Nornalup National Park	Maintain or improve the quality of groundwater to ensure that existing and potential uses, including ecosystem maintenance are protected, consistent with the draft WA Guidelines for Fresh and Marine Waters (EPA, 1993).	Now that the WWTP will be constructed on predominantly cleared land, the site will require only levelling. Excavation, which was originally proposed for the vegetated portion of Site C, will no longer occur, with the result that groundwater flows will not be intercepted. Concerns that vegetation clearing required for the original proposal would cause a rise in the water table have been allayed now that the infrastructure will be constructed on predominantly cleared land. The sub-surface infiltration trench for the disposal of treated effluent will be constructed in deep dry sand beneath the sandy track to the east of the site, in the location of monitoring bores 6, 7, and 8. The trench will not interfere with the hydrology of the portion of Site C which has a perched water table. The design specification of the WWTP will be for high nutrient removal (final effluent levels of 1mg/L P and 10mg/L N) in comparison with septic tank/leach drain systems, and although the sandy soils in the infiltration trench discharge area have lower P removal capacity than loams and clays, the P removal capacity will not be zero. Discharge to the trench will discontinue as soon as a treelot is procured and commissioned. At the latest this will be when disposal volumes exceed 60m3/day, that is, less that one-third of the WWTP's design and operating capacity of 200m3/day (1,000 Equivalent Persons (EP)) or five years, whichever is sooner. Wastewater disposal for 300 EP, equates to an annual maximum disposal volume of 22 megalitres, in an estimated catchment water budget of 2,800 megalitres per annum. Seven groundwater monitoring bores have been installed. The WC is presently recording the chemistry and water levels, on a monthly basis, to establish background conditions. Monthly monitoring will continue after commissioning of the WWTP, and more bores may be installed if required.	Having regard to: a) modifications to the WWTP proposal as follows: • relocation of Stage 1 of the WWTP to predominantly cleared land; and • minimisation of changes to hydrology through use of alternative construction design; and b) the WC's commitments to: • monitor and report on groundwater quality (chemistry) and water levels; • cease disposal of treated effluent to the infiltration trench when volumes exceed 60m3/day, or within five years, or sooner if degradation of the receiving environment occurs; • develop site-specific contingency and incident management plans; • disposal of dried sludge to an approved facility; it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for Groundwater quality.

RELEVANT FACTOR	RELEVANT AREA	EPA OBJECTIVE	EPA ASSESSMENT	EPA ADVICE
			The WC will follow normal contingency management plans in the event of system failure. Generic contingency and incident management plans will be adapted to prepare plans site specific to the Walpole WWTP.	
Surface water quality	Surface water above the Walpole townsite and its environs, including the Walpole-Nornalup National Park, and the Walpole and Nornalup Inlets	Maintain or improve the quality of surface water to ensure that existing and potential uses, including ecosystem maintenance are protected, consistent with the draft WA Guidelines for Fresh and Marine Waters (EPA, 1993).	The basic objective of collecting the sewage effluent from Walpole is to enable current discharges of nutrient contaminated stormwater and groundwater to cease and in doing so to protect the water quality within Walpole Inlet. The quality of the final effluent will be very much better than the current discharges into the Walpole Inlet from the conventional septic tank and leach drain system. On the assumption of an output of 1.1kg/y/person of P and 3kg/yr/person of N, and an effluent concentration of 1mg/L P and 10mg/L N (and volume of 200L/day/person), the proposal will result in an estimated 93% reduction in P and a 75% reduction in N by the year 2005 (estimated) when the townsite is fully sewered and septic tank/leach drains are no longer in use. There is a short term risk that existing nutrients from the septic leachate in the soil under the Walpole townsite will overlap with nutrients entering the Walpole and Nornalup Inlets from the disposal of treated effluent. However, early commissioning of the proposed treelot, while disposal volumes are still low, will minimise the risk of this occurring. Although the sub-surface infiltration trench has been designed to dispose of up to 200m3/day of treated effluent, the WC has stated that it will commission a treelot for disposal of the treated effluent when volumes exceed only 60m3/day, or within five years, or if it appears that degradation may occur, whichever of these is the sooner. To detect degradation, the WC will monitor groundwater chemistry and water levels, together with surface water monitoring. The following modifications to the WC's preliminary plans will minimise the impact of the proposal upon surface water quality: • onsite stormwater will be infiltrated into the soil profile, via soak wells and linear swale drains, to minimise changes to groundwater recharge within the site which may have occurred with the original proposal for a subsoil drainage system (CER, Appendix B);	Having regard to: a) modifications to the WWTP including: • infiltration of onsite stormwater into the soil profile; and • withdrawal of the RBTS from the proposal; and b) the WC's commitments to: • monitor and report on surface water quality in TP Creek; • cease disposal of treated effluent to the infiltration trench when volumes exceed 60m3/day, or within five years, or if it appears that degradation of the receiving environment may occur, whichever of these is the sooner; • dispose of dried sludge to an approved facility; and • develop site-specific contingency and incident management plans; it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for Surface water quality.

RELEVANT FACTOR	RELEVANT AREA	EPA OBJECTIVE	EPA ASSESSMENT	EPA ADVICE
			• the RBTS has now been withdrawn from the current Stage 1 proposal and it is intended that it be permanently superseded by the early commissioning of a treelot facility. In addition, the WC has established surface water monitoring points at five locations and monitoring has commenced. The monitoring and reporting on surface water quality in TP Creek will continue in accordance with DEP licence specifications, to the satisfaction of the Pollution Control Branch of the DEP. Most of the concerns raised by the WRC are process details which will be addressed and dealt with during the tender selection and DEP licensing processes, which will ensure that the outlined performance criteria are met. Sludge from effluent polishing by chemical dosing will, as is usual, be settled in a sedimentation tank prior to discharge of the final treated effluent. The sludge will be solar dried and transferred off-site to an appropriate landfill, subject to the Shire of Manjimup's approval.	

several hectares of sedgeland and other vegetation which, although outside the Walpole-Nornalup National Park, is potentially of regional significance.

The sub-surface infiltration trench, proposed to provide disposal of tertiary treated effluent discharged from the WWTP, is located on a cleared access track/firebreak, but partly within the Walpole-Nornalup National Park. The National Parks and Nature Conservation Authority (in whom the land is vested) must provide separate approval for the infiltration trench to enter upon National Park land, so the Water Corporation is pursuing this matter.

Public submissions contended that the vegetation which would be impacted by the initial proposal is part of a unique palusmont wetland system which is regionally significant, that the vegetation survey work was insufficient to establish the vegetation's significance or otherwise, and that the vegetation survey was undertaken at the wrong time of the year to easily detect Declared Rare Flora and Priority Flora. A number of potential indirect impacts were outlined, both within the site (Reserve No. 29778) and within the adjacent Walpole-Nornalup National Park. Potential indirect impacts include weed invasion, alteration of the water and nutrient balances, and spread of dieback. The Department of Conservation and Land Management also requested that it (and/or the National Parks and Nature Conservation Authority) be compensated, preferably in the form of a land swap, should any deleterious impacts eventuate.

Since the release of the CER, a number of modifications have been made to the proposal (see Section 2 above for complete list).

Assessment

The area considered for assessment of this factor is the Warren Biogeographical Region, as delineated in *An Interim Biogeographic Regionalisation for Australia* (Thackway, 1995).

The EPA's objective in regard to this environmental factor is to maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities.

Proposal modifications relevant to this factor are:

- relocation of Stage 1 of the WWTP to a predominantly cleared portion of the "C" Class Crown Reserve No. 29778 (Forestry Purposes); and
- withdrawal of the RBTS from Stage 1, which it is anticipated will be permanently superseded by the early commissioning of a treelot facility.

These modifications will result in little vegetation clearing and thus significantly minimise or eliminate direct impacts. The extent of the new site is more than 3,000 square metres, of which only about 1,000 square metres is vegetated. The land requirements for the WWTP are anticipated to be less than 1,500 square metres, so the actual layout of the WWTP can be negotiated with the successful tenderer to minimise disturbance of vegetation.

There is still the potential for indirect impacts from the WWTP and the sub-surface infiltration trench to degrade the phreatophytic vegetation and other vegetation in both Reserve No. 29778 and that portion of the Walpole-Nornalup National Park which is the receiving environment for the treated effluent being discharged into the sub-surface infiltration trench. With respect to the phreatophytic vegetation, however, it is noted that it is in good biological condition despite having been subject to increased runoff, additional sediment load and increased nutrient loading resulting from cleared, grazed land in the upper parts of TP Creek's catchment. The Water Corporation is currently fulfilling one of its commitments, namely to undertake additional flora and vegetation survey work. The purposes of the additional survey work are to acquire baseline data in that part of the Walpole-National Park which lies downslope of the sub-surface infiltration trench, to establish a vegetation monitoring program, and to provide confirmation that no Declared Rare Flora or Priority Species will be affected by disposal to the sub-surface infiltration trench.

The proponent has also provided additional commitments relating to the remaining areas of concern for this factor. One commitment is to divert the treated effluent from the sub-surface infiltration trench to a treelot facility when volumes exceed 60 cubic metres per day (which is

infiltration trench to a treelot facility when volumes exceed 60 cubic metres per day (which is less than one-third of the 200 cubic metres per day capacity), or within five years, or if it appears that degradation may occur, whichever of these is the sooner. Any further use of the sub-surface infiltration trench for contingency purposes would be subject to licensing by the DEP, in liaison with the NPNCA. Other commitments include monitoring of groundwater and nutrient levels so that potential impacts upon vegetation can be recognised at an early stage; monitoring of vegetation within the Walpole-Nornalup National Park and mitigation provisions (possibly in the form of a land swap) in the unlikely event that degradation to vegetation within the Walpole-Nornalup National Park does occur; minimisation of weed invasion; and dieback hygiene protocols.

Having particular regard to the:

(a) proponent's modifications to the WWTP proposal, including relocation of Stage 1 to a predominantly cleared site and withdrawal of the RBTS from the proposal; and

(b) proponent's commitments to:

- undertake additional vegetation survey work to establish baseline data and a monitoring program;
- monitor vegetation in the receiving environment downslope from the sub-surface infiltration trench;
- monitor chemistry (including nutrient loadings) and water levels in the receiving environment;
- establish a treelot facility at the earliest date possible;
- cease disposal of treated effluent to the infiltration trench when volumes exceed 60 cubic metres per day, or within five years, or if it appears that degradation of the receiving environment may occur, whichever of these is the sooner;
- minimise the risk of weed invasion;
- implement dieback hygiene protocols; and
- negotiate mitigation measures if necessary, possibly in the form of a land swap;

it is the EPA's opinion that the proposal can meet the EPA's objective for Vegetation Communities.

3.3 Wetlands

Description

The original proposed site (on a vegetated portion of Reserve No. 29778) was located upon part of an upland-wetland which may be regionally significant. There are numerous wetlands in the Walpole-Nornalup National Park which is directly adjacent. The construction phase for the WWTP, its associated infrastructure and the proposed RBTS, and the ongoing operation of the treatment plant have the potential to significantly alter the hydrology in the area and cause adverse impacts upon the wetlands.

The main area of concern raised in public submissions was that the proposed site was located on a hill-based or upland-wetland, termed a "palusmont". One submitter defines palusmonts as hill-capping wetlands that only form in wet climates and further states that Walpole is the only region in the State where the climate is wet enough to develop and sustain palusmonts. To date, this palusmont (Chugg Street Palusmont) is only one of two to have been found in Western Australia, so it should be considered as being of regional, State-wide or even national significance as a wetland type. The wetland displays seasonal variation between winter and summer water levels.

Insufficient hydrological studies have been completed to substantiate the source of water for the wetland system (whether rainfall only, or whether a combination of rainfall and a distal source such as subartesian upwelling). As a result, there is concern that the proposed zone of sub-surface infiltration may cut through an area with a high groundwater table.

In addition, it was submitted that alteration of the site's hydrology could disturb the downslope population of *Reedia spathacea* (Figure 1). Walpole is the core location for a primitive form of the Cyperaceae family, *R. spathacea*. *R. spathacea* is only a Priority 4 species (CALM), but the *R. spathacea* swamps occur in a variety of edaphic situations and sites (paluslope, palusplain and river environs) and its occurrence at the western base of Chugg Street Palusmont represents an important variation from other sites.

Since the release of the CER, a number of modifications have been made to the proposal in order to minimise environmental impacts (see Section 2 above for complete list).

Assessment

The area considered for assessment of this factor is wetlands surrounding Walpole, including Walpole Inlet.

The EPA's objective in regard to this environmental factor is to maintain the integrity, functions and environmental values of wetlands.

The full extent of the upland wetland cannot be clearly delineated until substantiated by further studies. One estimate, however, is that the sedgelands cover approximately eight to ten hectares, of which approximately 70-80%, including the wetland's topographic crest, is secured within the Walpole-Nornalup National Park.

Proposal modifications relevant to this factor are:

- relocation of the WWTP to predominantly cleared land, on that part of the Department of Conservation and Land Management Depot which is currently being used for the purpose of explosives storage, and is also further distant from the topographic crest of the upland wetland than the site originally proposed;
- withdrawal of the proposed RBTS, leading to a reduction in the size of the site to be used (to less than 1 hectare) and its consequent impact upon the upland wetland; and
- minimisation of changes to site hydrology through replacement of the initially proposed subsoil drainage with direct recharge of stormwater as close as possible to where rainwater is collected.

These modifications will avoid or significantly minimise any potential adverse impact upon wetlands, including both direct loss and hydrological changes. In addition, baseline data (water levels and chemistry, including nutrient loadings) are being collected from groundwater monitoring bores which have been installed, and from surface water sampling points. Monitoring will be ongoing.

Recent data (June 1998) confirms that the site proposed for the infiltration trench does not display a perched or seasonally high water table, that the valley slope terrain to the east of the trench consists of deep sands with a water table at 4.05 - 5.65 metres below surface, and that as a result the infiltration process will operate efficiently (Bowman Bishaw Gorham, August 1998). The hydraulic efficiency of the sloping infiltration trench will be maximised by the use of impervious baffles (every 20 metres) which will increase the flooded cross section area.

The nearest swamplands with *R. spathacea* populations are to the west, in a broad drainage line located within the Walpole-Nornalup National Park. Following the above modifications, the proposal should not detrimentally affect that catchment's hydrology or the *R. spathacea* populations, particularly given that the 200 hectare catchment includes drainage from approximately 90 hectares of cleared and grazed farmland.

Having particular regard to the:

(a) proponent's modifications to the WWTP, including reduction in the areal extent of land to be used; location of infrastructure on predominantly cleared land; and minimisation of changes to hydrology through use of alternative construction design;

(b) fact that a large portion of the sedgelands, including the topographic crest of the wetland, is secured within the Walpole-Nornalup National Park; and

(c) proponent's commitments to:

- minimise changes to existing shallow groundwater flow and groundwater recharge by incorporation of stormwater management structures; and
- monitor and report on ground and surface water quality (chemistry and water levels);

it is the EPA's opinion that the proposal can meet the EPA's objective for Wetlands.

3.4 Odour

Description

Odours emanating from the proposed WWTP may adversely affect the welfare and amenity of the Walpole township and the surrounding community.

Submissions stated that the CER's conclusion that a 500 metre buffer around the WWTP will be adequate is not supported by weather data from the proponent, and the proposed tree buffer is not substantial enough to mitigate odours. Concerns were expressed that wind speeds and directions could deliver odours to the Walpole townsite during peak tourist seasons. The northern fringe of Walpole townsite is the commercial and tourist portion, so consequences of WWTP odours will be greater than simply offending local residents. The Bureau of Meteorology's regional information was quoted to support concerns. There are recorded speeds of 11-30 and >30 kilometres per hour from the northeast quadrant during January, and speeds of 11-30 kilometres per hour from the east quadrant during April.

Assessment

The area considered for assessment of this factor is the Walpole township and surrounding community.

The EPA's objective in regard to this environmental factor is that odours emanating from the proposed development should not adversely affect the welfare and amenity of other land users.

Dispersion modelling was not possible because the Walpole wind data held by the Department of Conservation and Land Management does not meet modelling requirements (using AUSPLUME), and regional data do not contain sufficient local detail. However, the dissipation of odour emissions increases in magnitude and effectiveness as the velocity of prevailing winds increase, so the strong winds which occur will assist in lowering the odour nuisance risk in surrounding downwind areas, during the tourist season in particular, rather than the reverse.

The WWTP proposed for Walpole is a modern advanced treatment system which utilises a biological process operating in an oxygen rich environment. Consequently the process and plant should not produce the earthy type odour which can result from the biological process. The risk of hydrogen sulphide being released at the plant inlet is also low, because the wastewater will be relatively fresh.

The proponent has made a commitment that if odour nuisance occurs outside a 500 metre radius, then odour control measures will be implemented to ensure that operation of the WWTP complies with the Department of Environmental Protection's licence conditions.

Having particular regard to the:

(a) proponent's commitment to implement odour control measures in the event of odour nuisance being observed outside a 500 metre radius; and

(b) fact that the WWTP will be subject to the Department of Environmental Protection's licence conditions;

it is the EPA's opinion that the proposal can meet the EPA's objective for odour.

3.5 Surface water quality - water courses and the Walpole and Nornalup Inlets

Description

Walpole and Nornalup Inlets and the watercourse known as TP Creek, which is located downslope from the receiving environment for the effluent discharged into the sub-surface infiltration trench, may be adversely impacted by increased nutrient loads.

In its submission, the Water and Rivers Commission stated that its overriding concern is the health of the Walpole and Nornalup Inlets. The proposed WWTP should, in the longer term, significantly reduce the nutrient load currently flowing into the Inlets from the septic tanks and leach drains in the Walpole townsite and environs. The WWTP is therefore the preferred option.

In another submission, concern was expressed that if nutrients were to move quickly down TP Creek, following disposal in the sub-surface infiltration trench, then for a time the Walpole Inlet may receive nutrients from this source as well as from the leachate from under the Walpole townsite.

Concerns were expressed relating to the disposal of excess water resulting from a rise in water table (due to vegetation clearing) and the originally proposed subsoil drainage system. The Walpole-Nornalup National Park may be affected hydrologically through the discharge of excess water into the natural system.

Other submissions expressed concern that the water course (TP Creek) in Walpole-Nornalup National Park may also be affected hydrochemically because the water may be nutrient enriched. The success or failure of nutrient removal during the secondary treatment process appears to be subject to an unacceptably high level of uncertainty, but even if levels of 1 milligram per litre of phosphorus and 10 milligrams per litre nitrogen are achieved, these are considerably higher than groundwater levels. The effectiveness of the RBTS system has not been validated in the local context, so the operating licence should be based on the output from the earlier phase of treatment. Nutrient absorption of the soils between the sub-surface infiltration trench and the natural drainage line (TP Creek) has not been documented, and it is likely that nutrients discharged into the sub-surface infiltration trench will not be retained in the soil, so that enriched water would rapidly discharge to hydraulically lower sites. A submitter assumed that the quantity of treated effluent is 600 kilolitres per day at full capacity.

The infiltration trench has a fall of 4.5 metres over its 208 metre length, which will tend to duct most effluent towards the lowest southerly end. A submission indicated that the precautionary approach should be adopted whereby the full length of the infiltration trench is utilised for the crossflow infiltration.

A number of technical details, including monitoring during commissioning of the WWTP to ensure it complies with minimum performance criteria, chemical dosing, and the storage and disposal of bonded nutrients were not addressed in the CER.

Failure of the WWTP system was not addressed in the CER.

Assessment

The area considered for assessment of this factor is surface water above the Walpole townsite and its environs, including the Walpole-Nornalup National Park, and the Walpole and Nornalup Inlets.

The EPA's objective in regard to this environmental factor is to maintain or improve the quality of surface water to ensure that existing and potential uses, including ecosystem maintenance, are protected, consistent with the draft WA Guidelines for Fresh and Marine Waters (EPA, 1993).

Nutrient loaded and contaminated stormwater and groundwater is currently being discharged into the Walpole Inlet. The basic objective of collecting the sewage effluent and treating it is to mitigate this situation, and, in so doing, to protect the water quality within the Walpole and Nornalup Inlets. The quality of the final effluent will be much higher than that from the septic tank and leach drain system, resulting in an estimated 93% reduction in phosphorus and a 75% reduction in nitrogen from domestic effluent disposal in Walpole to the Walpole and Nornalup Inlets by the year 2005, when it is estimated that the townsite will be fully sewered and all residents connected (see Table 4 below).

Table 4: Nutrient loadings in final effluent from the WWTP Stage 1, Walpole compared with septic tanks

	Population (Year 2005) ***	Phosphorus (kg/yr)	Nitrogen (kg/yr)
Septic tank discharge	405	450 *	1200 *
WWTP discharge	405	30 **	300 **
% reduction	-	93% reduction	75% reduction

Assumptions: * Output of 1.1 kg/yr/person of P, and 3 kg/yr/person of N.

** Concentration of P in final effluent = 1 mg/L, concentration of N in final effluent = 10 mg/L, and volumes per person = 200 L/day.

*** By the year 2005, the town will be 100% sewered.

Source: Bowman Bishaw Gorham (1998b).

Proposal modifications relevant to this factor are:

- relocation of Stage 1 to a predominantly cleared portion of "C" Class Crown Reserve No. 29778;
- infiltration of stormwater into the soil profile, via soak wells and linear swale drains, as close as possible to the capture areas; and
- withdrawal of the RBTS from Stage 1.

These modifications will address the concerns relating to adverse hydrological impacts which may have occurred as a result of proposed vegetation clearing and through using the originally proposed subsoil drainage system (CER, Appendix B).

With respect to the potential nutrient enrichment of surface waters, the specifications for the design and construction of the WWTP requires that tenders meet maximum levels of nutrient output, including 1 milligram per litre of phosphorus and 10 milligrams per litre of nitrogen. Similar technology to that proposed at Walpole is already currently used by the Water Corporation elsewhere, and has been meeting the specified effluent quality parameters.

Although the capacity of the sandy soils in the sub-surface infiltration trench to remove phosphorus from that treated effluent is lower than that of loams and clays, there will still be some further reduction in the tertiary treatment levels before the discharge reaches TP Creek and the Walpole Inlet. It should be noted that the figure of 600 kilolitres of treated effluent per day is the hypothetical level which would only be reached if an additional two stages of the WWTP were to be constructed, leading to a capacity of 3,000 EP. This assessment is for one stage only, with a capacity of 1,000 EP and a treated effluent output of 200 cubic metres per day at full capacity. However, the proponent has made a commitment to divert discharge of treated effluent from the sub-surface infiltration trench to a treelot when the output exceeds 60 cubic metres per day (which is less than one-third of the 200 cubic metres per day capacity), or within five years, or if it appears that degradation may occur, whichever is the sooner.

This latter commitment minimises the short term risk that nutrients entering the Walpole and Nornalup Inlets from the disposal of treated effluent could overlap with nutrients from the septic leachate in the soil under the Walpole townsite.

Surface water monitoring points have been established in five locations, and monthly monitoring has commenced to establish baseline data. Monitoring and reporting on surface water quality will be ongoing, in accordance with DEP licence specifications.

The sloping sub-surface infiltration trench has been designed so that impervious baffles (every 20 metres) will increase the flooded cross section area and thus maximise its hydraulic efficiency. This, together with all other technical details raised, including the chemical dosing process and storage of chemicals, will be addressed during the DEP licensing process.

With respect to dried sludge disposal, the proponent has made a commitment that disposal will be to an approved site, in accordance with the Shire of Manjimup's requirements.

A further commitment provides for a site-specific management plan to address contingencies and incidents such as overflows, shut downs and power failures.

Having particular regard to the:

(a) proponent's modifications to the WWTP, including relocation to a predominantly cleared site; infiltration of onsite stormwater into the soil profile; and withdrawal of the RBTS from the proposal; and

(b) proponent's commitments to:

- monitor and report on surface water quality, including TP Creek;
- divert disposal of the treated effluent from the sub-surface infiltration trench to a treelot when volumes exceed 60 cubic metres per day, or within five years, or if it appears that degradation of the receiving environment may occur, whichever of these is the sooner;
- dispose of dried sludge to an approved facility; and
- develop and implement a site-specific contingency and incident management plan to dispose of effluent safely in the event of plant failure;

(c) the significant improvement to the water quality of the Walpole and Nornalup Inlets, which will be a long term result of the proposal's implementation ; and

(d) fact that technical details will be managed under a Works Approval and Licence for this project under the provisions of Part V of the *Environmental Protection Act* 1986;

it is the EPA's opinion that the proposal can meet the EPA's objective for surface water quality.

3.6 Groundwater quality

Description

Groundwater under the site is likely to flow into the Walpole and Nornalup Inlets and may increase their nutrient loading. The WWTP and its infrastructure may impact upon groundwater levels and quality.

Submissions made during the public advertising period disputed the statement that the final treated effluent is to be discharged into a dry sandy soil profile, on the grounds that the proposed infiltration trench appears to intersect a dynamic aquifer (near piezometer P5) where groundwater is very high during the wet season. Furthermore, if artesian upwelling is confirmed, the situation would be even more critical. A submitter was concerned that the trench will change the hydrological regime of the receiving area west of TP Creek.

There was also a request that baseline monitoring of groundwater quality in the receiving environment be conducted.

Assessment

The area considered for assessment of this factor is groundwater below Walpole townsite and its environs, including the Walpole-Nornalup National Park.

The EPA's objective in regard to this environmental factor is to maintain or improve the quality of groundwater to ensure that existing and potential uses, including ecosystem maintenance, are protected, consistent with the draft WA Guidelines for Fresh and Marine Waters (EPA, 1993).

Proposal modifications relevant to this factor are:

- relocation of Stage 1 of the WWTP to predominantly cleared land; and
- use of alternative construction design to facilitate groundwater recharge by discharge rainfall as close to the capture area (such as car parks) as possible.

The predominantly cleared land will only require levelling, thus eliminating the need for the initially proposed excavation, which had the potential to intercept groundwater flows. Use of the predominantly cleared land also allays concerns that clearing of vegetation would cause a rise in the groundwater table.

The proposed sub-surface infiltration trench will be constructed in deep, dry sand beneath the cleared sandy access track to the east of the site, in the location of monitoring bores 6, 7 and 8. Recent data (June 1998) confirm that the site proposed for the infiltration trench does not display a perched or seasonally high water table, and that the valley slope terrain to the east of the trench consists of deep sands with a water table at 4.05 - 5.65 metres below surface. As a result, the trench is not expected to interfere with the hydrology of any portion of the site which has a perched water table.

With respect to nutrient loadings, the capacity of the WWTP to remove nutrients from the wastewater is significantly greater than that of the existing septic tank and leach drain systems. Although the capacity of the sandy soils in the sub-surface infiltration trench to remove phosphorus from the treated effluent is lower than that of loams and clays, there will still be some reduction in the tertiary-treated effluent levels of 1 milligram per litre phosphorus and 10 milligrams per litre nitrogen. The proponent's commitments to divert discharge of treated effluent to a treelot while disposal volumes are less than one-third the WWTP's design and operating capacity, or within five years, minimises the potential for increased nutrient loadings in groundwater below the Walpole townsite and its environs, including the Walpole-Nornalup National Park. It is noted that the wastewater disposal for 300 EP equates to an annual maximum disposal volume of 22 megalitres, in an estimated catchment water budget of 2,800 megalitres per annum.

As a precautionary measure, seven groundwater monitoring bores have already been installed and the chemistry and water levels are being recorded on a monthly basis to establish baseline data. Monthly monitoring will continue after the commissioning of the WWTP, and additional

bores will be installed if required. If it appears that degradation may be occurring, the proponent has committed to ceasing disposal to the sub-surface infiltration trench. A further precautionary measure will be the proponent's adaptation of generic contingency and incident management plans to site specific plans for the Walpole WWTP, for implementation in the event of system failure. The proponent has made a commitment that dried sludge will be disposed of to a site approved by the Shire of Manjimup, in accordance with usual sludge disposal practices.

Having particular regard to the:

(a) proponent's modifications to the WWTP, including relocation of Stage 1 to predominantly cleared land; and minimisation of changes to hydrology through use of alternative construction design; and

(b) proponent's commitments to:

- monitor and report on groundwater quality (chemistry) and water levels;
- divert disposal of treated effluent from the sub-surface infiltration trench when the volumes exceed 60 cubic metres per day, or five (5) years, or if it appears that degradation to the receiving environment may occur, whichever is the sooner;
- develop site-specific contingency and incident management plans for the Walpole WWTP; and
- dispose of dried sludge to an approved site;

it is the EPA's opinion that the proposal can meet the EPA's objective for Groundwater quality.

4. Conditions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of commitments to ameliorate the impacts of the proposal on the environment. The commitments are considered by the EPA as part of its assessment of the proposal, and following discussion with the proponent the EPA may seek additional commitments.

The EPA recognises that not all of the commitments are written in a form which makes them readily enforceable, but they do provide a clear statement of the action to be taken as part of the proponent's responsibility for and commitment to continuous improvement in environmental performance. The commitments then form part of the conditions to which the proposal should be subject if it is to be implemented.

The EPA may, of course, also recommend conditions additional to that relating to the proponent's commitments.

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by the Water Corporation to construct, commission, operate and maintain a new Wastewater Treatment Plant on portion of the "C" Class Crown Reserve No. 29778 (Forestry Purposes) on Chugg Street to the northeast of the Walpole townsite, is approved for implementation. These conditions are presented in Appendix 3. Matters addressed in the conditions include:

(a) the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3;

(b) in order to manage the environmental impacts of the project, and to fulfil the requirements of the conditions and procedures in this statement, prior to construction, the proponent shall demonstrate to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection that there is in place an environmental management system which includes the following elements:

- environmental policy and commitment;
- planning of environmental requirements;
- implementation and operation of environmental requirements;
- measurement and evaluation of environmental performance; and
- review and improvement of environmental outcomes.

5. Other Advice

An indicative alignment is shown for a pumping main to a future woodlot (Figure 2). Whilst it does not form part of this assessment, the EPA notes that it may not be the most appropriate alignment to minimise disturbances to the surrounding Walpole-Nornalup National Park, and that it will need to be considered at the same time as the proposal for the treelot facility itself is referred to the EPA.

The EPA also notes that, in order to ensure that the conservation value of the Walpole and Nornalup Inlets is maintained or enhanced, residents should be encouraged to connect to the sewerage system within as short a time as possible.

6. Conclusions

The EPA has considered the proposal by the Water Corporation to construct, commission, operate and maintain a new Wastewater Treatment Plant on portion of the "C" Class Crown Reserve No. 29778 (Forestry Purposes) on Chugg Street to the northeast of the Walpole townsite.

The EPA has concluded that the modified wastewater treatment plant proposal is capable of meeting the EPA's objectives subject to the Water Corporation's commitments and recommended EPA conditions.

Modifications to the original proposal include:

- almost total reduction in the areal extent of vegetation to be cleared, through relocation of the treatment plant to predominantly cleared land and withdrawal of the reed bed treatment system; and
- minimisation of changes to surface and groundwater hydrology, through incorporation of alternative construction design and incorporation of stormwater management structures.

In arriving at its conclusion, the EPA also notes that a significant portion of the sedgeland vegetation and the supporting 'upland' wetland, including the wetland's topographic crest, is secured within the Walpole-Nornalup National Park and there will be no impact upon any Declared Rare Flora or Priority Species.

The EPA strongly supports the Water Corporation's intention to divert, as soon as possible, disposal of treated effluent from the temporary sub-surface infiltration trench to irrigate a treelot, located outside Walpole-Nornalup National Park. Nevertheless, the proposal for the treelot, including the alignment of the pumping main, will need to be referred to the EPA separately.

The EPA also advises, under Other Advice, that in order to ensure maintenance or enhancement of the conservation value of the Walpole and Nornalup Inlets, residents should be encouraged to connect to the sewerage system within as short a time as possible.

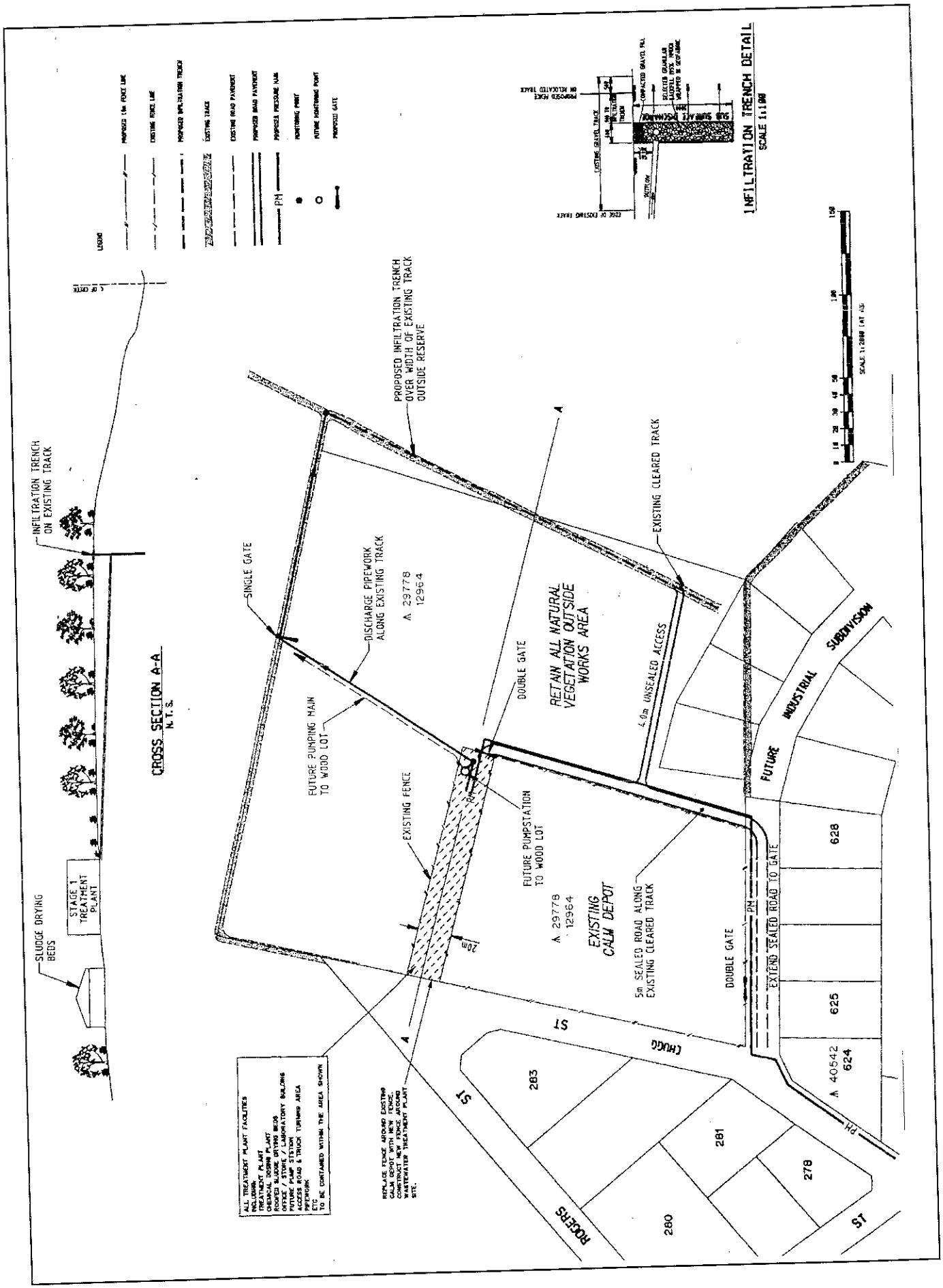

Figure 2. Site plan and layout.

7. Recommendations

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister considers the report on the relevant environmental factors of vegetation communities, wetlands, odour, surface water quality and groundwater quality as set out in Section 3.
2. The Minister notes that the EPA has concluded that the proposal can be managed in an environmentally acceptable manner, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Section 4.
3. The Minister imposes the conditions and procedures recommended in Appendix 3 of this report.

Appendix 1

List of submitters

Organisations:

Submissions were received from six organisations:

- Denmark Conservation Society;
- Department of Conservation and Land Management;
- Department of Environmental Protection;
- Shire of Manjimup;
- Walpole-Nornalup National Parks Association; and
- Water and Rivers Commission.

Individual:

Submissions were received from three individuals:

- John Kolo;
- Joe Burton; and
- J & M Hughes.

Appendix 2

References

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Appendix 3

Recommended Environmental Conditions and proponent's consolidated commitments

Statement No.

RECOMMENDED CONDITIONS

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

WASTEWATER TREATMENT PLANT, STAGE 1 AT CHUGG STREET, WALPOLE
SHIRE OF MANJIMUP

Proposal:

Construction and operation of a 1,000 equivalent persons capacity wastewater treatment plant to serve the Walpole townsite and its environs. The site is known as Site C, located on Chugg Street, Walpole, on a predominantly cleared portion of "C" Class Crown Reserve No. 29778 (Forestry Purposes), currently used as a depot by the Department of Conservation and Land Management (See Figures 1 and 2).

Treatment will be by means of an extended aeration/activated sludge plant. Initial low levels of tertiary treated effluent will be disposed of in a sub-surface infiltration trench located beneath an existing 6 metre firebreak/access track abutting and partly within the Walpole-Nornalup National Park. A treelot is planned for future disposal of the treated effluent.

Proponent: Water Corporation

Proponent Address: 629 Newcastle Street, Leederville 6007

Assessment Number: 1154

Report of the Environmental Protection Authority: Bulletin 909

The proposal to which the above report of the Environmental Protection Authority relates may be implemented subject to the following conditions and procedures:

1 Implementation

1-1 Subject to these conditions and procedures, the proponent shall implement the proposal as documented in schedule 1 of this statement.

1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

2 Proponent Commitments

2-1 The proponent shall implement the consolidated environmental management commitments documented in schedule 2 of this statement.

2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of conditions and procedures in this statement.

3 Performance Review

3-1 Each six years following the commencement of construction, the proponent shall submit a Performance Review to the Department of Environmental Protection:

- to document the outcomes, beneficial or otherwise;
- to review the success of goals, objectives and targets; and
- to evaluate the environmental performance over the six years;

relevant to the following:

1 environmental objectives reported on in Environmental Protection Authority Bulletin 909;

2 proponent's consolidated environmental management commitments documented in schedule 2 of this statement and those arising from the fulfilment of conditions and procedures in this statement;

3 environmental management system environmental management targets;

4 environmental management programs and plans; and/or

5 environmental performance indicators;

to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

Note: The Environmental Protection Authority may recommend changes and actions to the Minister for the Environment following consideration of the Performance Review.

4 Proponent

4-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person in respect of the proposal.

4-2 Any request for the exercise of that power of the Minister referred to in condition 4-1 shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the proposal in accordance with the conditions and procedures set out in the statement.

4-3 The proponent shall notify the Department of Environmental Protection of any change of proponent contact name and address within 30 days of such change.

5 Commencement

5-1 The proponent shall provide evidence to the Minister for the Environment within five years of the date of this statement that the proposal has been substantially commenced.

5-2 Where the proposal has not been substantially commenced within five years of the date of this statement, the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment will determine any question as to whether the proposal has been substantially commenced.

5-3 The proponent shall make application to the Minister for the Environment for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement at least six months prior to the expiration of the five year period referred to in conditions 5-1 and 5-2.

5-4 Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years for the substantial commencement of the proposal.

6 Compliance Auditing

6-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit program prepared in consultation between the proponent and the Department of Environmental Protection.

6-2 Unless otherwise specified, the Chief Executive Officer of the Department of Environmental Protection is responsible for assessing compliance with the conditions, procedures and commitments contained in this statement and for issuing formal clearances.

6-3 Where compliance with any condition, procedure or commitment is in dispute, the matter will be determined by the Minister for the Environment.

Note

1 The proponent is required to apply for a Works Approval and Licence for this project under the provisions of Part V of the Environmental Protection Act.

Schedule 1

The Proposal

Construction and operation of a wastewater treatment plant to serve the Walpole townsite and its environs. The site is known as Site C, located on Chugg Street, Walpole, on a predominantly cleared portion of "C" Class Crown Reserve No. 29778 (Forestry Purposes), currently used as a depot by the Department of Conservation and Land Management (See Figures 1 and 2).

The treatment is by means of an extended aeration/activated sludge plant of 1,000 equivalent persons capacity, producing final treated wastewater of less than 1 milligram per litre total phosphorus, less that 10 milligrams per litre total nitrogen, less than 10 milligrams per litre five-day biological oxygen demand, less than 20 milligrams per litre suspended solids and less than 150 thermotolerant coliforms per 100 millilitres.

Initially, while the volume of treated effluent is low, it will be disposed of in a sub-surface infiltration trench located beneath an existing 6 metre firebreak/access track abutting and partly within the Walpole-Nornalup National Park. (When sufficient volumes are available, the treated effluent will be discharged to a treelot which is not part of this proposal.)

The design and construction of the plant will be performance-based on the above treated wastewater output. Construction is expected to commence early in 1999 and be of about six months' duration.

Key Characteristics Table

Element	Quantities/Description
Life of project	Longterm - until service requirements exceed 1,000 equivalent persons - not known
Output (treated effluent)	200 cubic metres per day First year output is estimated to be less than 20 cubic metres per day
Estimated quality of output	Less than: 1 milligram per litre total phosphorus; 10 milligrams per litre total nitrogen; 10 milligrams per litre 5-day biological oxygen demand; 20 milligrams per litre suspended solids; and 150 thermotolerant coliforms per 100 millilitres
Area of disturbance treatment plant (including access) infiltration trench (beneath existing cleared track)	 Less than 1 hectare 208 metres long and 3 metres deep

List of major components - plant laboratory power supply chemical storage sludge drying beds infiltration trench car parking area	See plans and specifications for details

Commitment	Objective	Action	Timing	Whose advice	Measurement/Compliance criteria
1. Minimise changes to existing shallow groundwater flow and groundwater recharge within the treatment plant site.	Maintain offsite sedgeland vegetation.	Issue tender documents for the design and construction which incorporate specifications requiring that all rainfall from hard surfaces is redirected to the ground.	Before design phase.	DEP/WRC.	Tender documents submitted to DEP.
2. Maintain optimum process efficiency for nutrient removal and final effluent disposal by a subsoil infiltration trench (until a treelot is commissioned).	Maintain estuary water quality, groundwater quality and surface water quality.	Design construct and operate WWTP to achieve 10 mg/L N, 1mg/L P.	Design and operational phase.	DEP/WRC.	Annual monitoring report to DEP.
3. Monitor and report on surface water and groundwater quality (including chemistry and water levels) on the western margin of TP Creek and within TP Creek.	Maintain estuary water quality, groundwater quality and surface water quality.	Report to DEP.	Operational phase.	DEP/WRC	Annual performance compliance report to DEP.
4. Control odour.	Maintain the amenity of nearby residents.	Operate the WWTP to eliminate production of odour so that there are no detectable odours outside a 500 metre radius from the plant, and in the event of nuisance odour, implement odour control.	Operational phase.	DEP.	Annual monitoring report to DEP.

Commitment	Objective	Action	Timing	Whose advice	Measurement/Compliance criteria
5. Implement dieback control program.	Maintain vegetation health.	Develop hygiene protocols and implement them.	Construction phase.	CALM, DEP.	Letter from CALM.
6. Prevent introduction of weeds.	Prevent degradation of vegetation by the introduction of weeds.	In the event of a screening buffer being planted, develop and implement land use management program.	Operational phase.	CALM, DEP	Development of plan: letter from CALM. Implementation: performance compliance report submitted to DEP.
7. Within 12 months of the issuing of formal authority from the Minister for the Environment, the WC will identify and reach agreement on the establishment of a suitably sized treelot to ensure that it is available to meet commitment No. 8.	Maintain groundwater quality, surface water quality and vegetation health.	Identify and reach agreement on the establishment of a suitably sized treelot	Within 12 months of the issuing of formal authority from the Minister for the Environment.	DEP/WRC.	Performance compliance report submitted to DEP.

Commitment	Objective	Action	Timing	Whose advice	Measurement/Compliance criteria
8. Cease normal disposal to infiltration trench and commence disposing to treelot when disposal volumes exceed 60 m^3/day, or within 5 years, whichever is sooner. Commence disposal to treelot if it is demonstrated that discharge to infiltration trench is causing degradation to groundwater quality, surface water quality or vegetation health.	Maintain groundwater quality, surface water quality and vegetation health.	Cease disposing to infiltration trench and commence disposing to treelot when disposal volumes exceed 60 m^3/day. Commence disposal to treelot if it is demonstrated that discharge to infiltration trench is causing degradation to groundwater quality, surface water quality or vegetation health.	Disposal volumes exceed 60 m^3/day, or within 5 years of the issuing of formal authority from the Minister for the Environment, or if it is demonstrated that discharge to infiltration trench is causing degradation (whichever occurs first).	DEP/WRC.	Performance compliance report submitted to DEP.
9. Manage incidents (including overflows, shutdowns, power failures and the like).	Maintain estuary, groundwater quality, surface water quality and vegetation health and prevent odours.	Develop site specific incident management plans.	Prior to commissioning.	DEP.	An approved incident management plan.
10. Dried sludge will be disposed of to an approved site.	Maintain estuary, groundwater quality, surface water quality and vegetation health.	Dispose of dried sludge to an approved site.	For the life of the plant.	Shire of Manjimup.	Letter from the Shire of Manjimup.
11. Prevent degradation of vegetation within the Walpole-Nornalup National Park.	Maintain health of vegetation within the Walpole-Nornalup National Park.	If it is demonstrated that the WWTP has caused damage to the vegetation within the Walpole-Nornalup National Park, negotiate appropriate mitigation (most likely in the form of a land swap) with NPNCA.	For the life of the plant.	NPNCA.	Letter from the NPNCA confirming that mitigation, if required, is adequate.

Commitment	Objective	Action	Timing	Whose advice	Measurement/Compliance criteria
12. Prevent deterioration of vegetation downslope from the infiltration trench.	Maintaining vegetation health.	Undertake a vegetation survey (including identification of Declared Rare Flora) prior to construction to establish a baseline, and develop and implement a long-term monitoring program.	Within 1 month of the issuing of formal authority from the Minister for the Environment, submit the vegetation survey report.	DEP/CALM.	Submission of the vegetation survey and monitoring program to DEP. Implementation: submission of performance compliance report to DEP.
13. Implement systems and procedures to ensure that commitments are met.	Address estuary, groundwater quality, surface water quality and vegetation health.	Develop and implement an Environmental Management System.	Construction phase, operational phase and decommissioning phase.	DEP.	Submission of EMS to DEP.
14. Develop and implement a decommissioning management plan for the WWTP and associated infrastructure, including the sub-surface infiltration trench.	Maintain estuary, groundwater quality, surface water quality and vegetation health.	Develop decommissioning management plan addressing removal of plant and infrastructure, rehabilitation of disturbed areas and identification of contaminated areas. The plan will be made publicly available.	At least 6 months prior to decommissioning the WWTP.	DEP, CALM, WRC.	Development: submission of a decommissioning management plan. Implementation: Submission of a performance compliance report.

Abbreviations:

CALM	Department of Conservation and Land Management
DEP	Department of Environmental Protection
EMS	Environmental Management System
EPA	Environmental Protection Authority
NPNCA	National Parks and Nature Conservation Authority
WC	Water Corporation
WWTP	Wastewater Treatment Plant

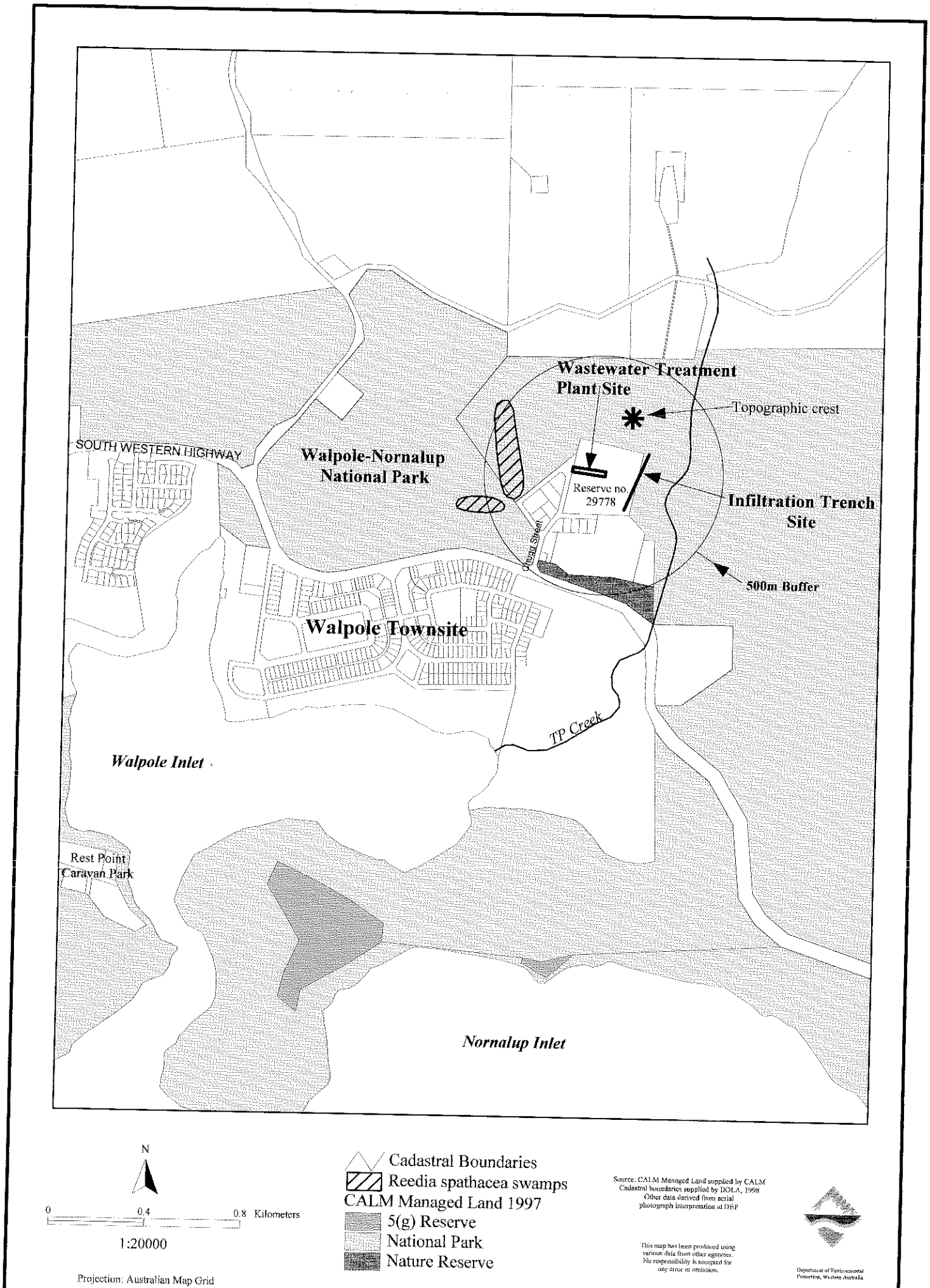

Figure 1. Location